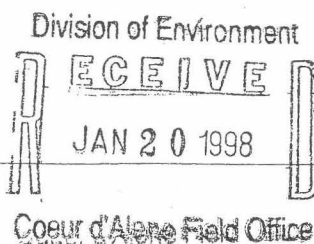




Earth and Environmental Technologies



Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Fax 206.328.5581
Tel 206.324.9530
www.hartcrowser.com

Letter of Transmittal

To: Potlatch Corporation
1100 Railroad Avenue
P.O. Box 386
St. Maries, Idaho 83861

Date: January 16, 1998

Job No.: J-2296-07

Attn: Mr. Gregory Rapp

Re: Avery Landing Recovery System

We are sending the following items:

Date	Copies	Description
December 11, 1997	2	Second Quarter Performance Report for 1997

These are transmitted:

☐ For your information ☐ For action specified below ☐ For review and comment ☒ For your use ☐ As requested

Remarks

--

By:

Pauletta M. Abraham
Pauletta M. Abraham

Copies to: Mr. Kreg Beck, IDEQ

Title: Project Assistant



HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Fax 206.328.5581
Tel 206.324.9530
www.hartcrowser.com

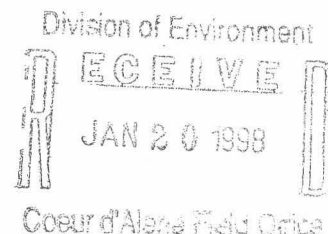
J-2296-07

December 11, 1997

Mr. Gregory A. Rapp
Construction Services Manager
Potlatch Corporation
1100 Railroad Avenue
P.O. Box 386
St. Maries, Idaho 83861

Re: Second Quarter Performance Report for 1997
Avery Landing Recovery System

Dear Mr. Rapp:



Hart Crowser is pleased to present the Second Quarter Performance Report for 1997 for the free product recovery system at the Avery Landing site. This letter report presents the second quarter groundwater elevation and product thickness measurements. Due to weather in the spring, the system was started late this year; therefore, this second quarter monitoring event is the final monitoring event for 1997.

GROUNDWATER AND PRODUCT QUARTERLY MONITORING

Four extraction wells (EW-1, EW-2, EW-3, and EW-4), three monitoring wells (HC-1, HC-4, and MW-5), and two piezometers (P-1, and P-2) were monitored on October 9, 1997. The locations of the monitoring points are shown on Figure 1. At each monitoring location, depth to product, product thickness, and depth to groundwater measurements were recorded. These measurements are presented with those of previous monitoring rounds in Table 1 at the end of the text. If a location indicated the presence of product but we were unable to obtain product-related



measurements, it is indicated in Table 1 as a sheen in the depth to product column. The river elevation was also monitored by taking measurements of the elevation difference between the top of the extraction vaults and the river.

Extraction well EW-3 contained 0.78 foot of product. Extraction wells EW-2 and EW-4 each had a trace of product detected. Well HC-4 continues to have product present, with a thickness of 2.25 feet detected during the current monitoring round. Wells EW-1, HC-1, MW-5, and the piezometers did not indicate the presence of product.

Extraction well EW-4 was not operational during the second quarter monitoring event. This is why there was no containment in the area of EW-4. The pump was replaced in EW-4 on October 16, 1997, and the system restarted. During the maintenance event the pumps from EW-2 and EW-3 were also removed to check and lower the water level sensors. Except for lack of containment in the EW-4 area, the general trends observed during this round of monitoring were consistent with previous rounds.

Though the system was not maintaining absolute containment, the depression in the groundwater level does appear to be collecting most of the free product. Some oil was seen seeping into the river from an area due south of EW-3 that had been eroded during the spring flooding. The oil booms were moved to intercept this oil. We do not believe this oil moved past the treatment system, but was already past the system before treatment began. The oil seeping into the river is very thick, whereas the oil being recovered directly upgradient is much thinner.

PROJECT SCHEDULE

Table 2 presents the project schedule for the remainder of 1997. As indicated, we will prepare an Annual Report for 1997. If you should decide that this date needs to be altered, please let us know as soon as possible.

LIMITATIONS

Work for this project was performed, and this letter prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar location, at the time the work was performed. It is intended for the exclusive use of the Potlatch Corporation for specific application to the referenced property.





Potlatch Corporation
December 11, 1997

J-2296-07
Page 3

If additional information or clarification is required, please call Terry Montoya at (206) 324-9530.

Sincerely,

HART CROWSER, INC.

TERRY MONTOYA
Project Engineer

DAVID HEFFNER, P.E.
Associate Engineer

229607/2ndQuarter97.doc

Attachments:

Table 1 - Avery Landing Groundwater Monitoring Data

Table 2 - Avery Landing Recovery System Remaining Project Schedule for 1997

Figure 1 - Avery Landing Second Quarter Groundwater Flow Direction Map

cc: Kreg Beck, Idaho Department of Environmental Quality



Table 1 - Avery Landing Groundwater Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation
EW-1	10/27/94	ND	11	0	95.34	84.34
	6/30/95	ND	10.9	0	95.34	84.44
	9/21/95	11.25	11.27	0.02	95.34	84.07
	7/11/96	ND	9.74	0	95.34	85.60
	9/11/96	ND	10.88	0	95.34	84.46
	11/5/96	ND	11.94	0	95.34	83.40
	7/17/97	ND	10.38	0	95.34	84.96
	10/9/97	ND	13.17	0	95.34	82.17
EW-2	10/27/94	ND	10.37	0	95.24	84.87
	6/30/95	10.57	10.89	0.32	95.24	84.35
	9/21/95	13.9	13.92	0.02	95.24	81.32
	7/11/96	11.03	11.66	0.63	95.24	83.58
	9/11/96	Sheen	14.00	0	95.24	81.24
	11/5/96	Sheen	12.27	0	95.24	82.97
	7/17/97	8.99	9.09	0.1	95.24	86.15
	10/9/97	Sheen	15.44	0	95.24	79.80
EW-3	10/27/94	ND	10.05	0	95.78	85.73
	6/30/95	9.35	9.8	0.45	95.78	85.98
	9/21/95	10.92	11.08+	0.16	95.78	84.70
	7/11/96	8.53	8.64	0.11	95.78	87.14
	9/11/96	10.75	11.70	0.95	95.78	84.08
	11/5/96	Sheen	11.8	0	95.78	83.98
	7/17/97	9.13	9.33	0.2	95.78	86.45
	10/9/97	10.9	11.68	0.78	95.78	84.10
EW-4	10/27/94	ND	8.05	0	94.32	86.27
	6/30/95	7.84	7.85	0.01	94.32	86.47
	9/21/95	8.22	8.24	0.02	94.32	86.08
	7/11/96	Sheen	6.44	0	94.32	87.88
	11/5/96	Sheen	8.08	0	94.32	86.24
	7/17/97	Sheen	5.43	0	94.32	88.89
	10/9/97	Sheen	7.11	0	94.32	87.21
HC-1	10/27/94	ND	13.25	0	97.50	84.25
	6/30/95	ND	12.00	0	97.50	85.50
	9/21/95	NM	13.42	0	97.50	84.08
	7/11/96	ND	11.92	0	97.50	85.58
	9/11/96	ND	12.90	0	97.50	84.60
	11/5/96	Could not locate due to snow				
	7/17/97	ND	11.27	0	97.50	86.23
	10/9/97	ND	12.87	0	97.50	84.63

Table 1 - Avery Landing Groundwater Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation
HC-4	10/27/94	13.3	15.34	2.04	98.94	83.60
	6/30/95	11.89	15.49	3.6	98.94	83.45
	9/21/95	13.67	NM	NM	98.94	85.27
	7/11/96	11.58	12.93	1.35	98.94	86.01
	9/11/96	13.53	13.93	0.40	98.94	85.01
	11/5/96	11.82	13.62	1.80	98.94	85.32
	7/17/97	11.65	13.25	1.60	98.94	85.69
	10/9/97	12.67	14.92	2.25	98.94	84.02
HC-5	11/5/96	ND	11.22	0	97.95	86.73
	7/17/97	Monument under standing water				
	10/9/97	Monument under standing water				
MW-4	9/14/94	ND	12.88	0	99.76	86.88
	6/30/95	ND	10.19	0	99.76	89.57
	9/21/95	ND	11.95	0	99.76	87.81
	7/11/96	Sheen	10.18	0	99.76	89.58
	9/11/96	Sheen	11.33	0	99.76	88.43
	11/5/96	Lost during the road construction				
MW-5	10/27/94	ND	10.45	0	97.76	87.31
	6/30/95	ND	9.13	0	97.76	88.63
	9/21/95	ND	10.83	0	97.76	86.93
	7/11/96	ND	8.98	0	97.76	88.78
	9/11/96	ND	10.71	0	97.76	87.05
	11/5/96	ND	10.65	0	97.76	87.11
	7/17/97	ND	8.75	0	97.76	89.01
	10/9/97	ND	10.89	0	97.76	86.87
MW-11	9/14/94	12	NA	NA	98.16	NA
	6/30/95	5.54	7.25	1.71	98.16	90.41
	7/11/96	6.34	10.00	3.66	98.16	88.16
	9/11/96	3.25	7.20	3.95	98.16	90.96
	11/5/96	3.05	7.20	4.15	98.16	90.96
	7/17/97	6.33	9.99	3.66	98.16	88.17
P-1	10/27/94	ND	17.31	0	101.42	84.11
	6/30/95	ND	16.72	0	101.42	84.70
	9/21/95	ND	17.4	0	101.42	84.02
	7/11/96	ND	15.87	0	101.42	85.55
	9/11/96	ND	16.98	0	101.42	84.44
	11/5/96	ND	17.06	0	101.42	84.36
	7/17/97	ND	15.34	0	101.42	86.08
	10/9/97	ND	17.64	0	101.42	83.78

Table 1 - Avery Landing Groundwater Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation
P-2	10/27/94	ND	15.87	0	100.06	84.19
	1/0/00	ND	15.26	0	100.06	84.80
	9/21/95	ND	16.04	0	100.06	84.02
	7/11/96	ND	14.52	0	100.06	85.54
	9/11/96	ND	15.62	0	100.06	84.44
	11/5/96	ND	15.08	0	100.06	84.98
	7/17/97	ND	13.92	0	100.06	86.14
	10/9/97	ND	16.09	0	100.06	83.97
River EW-1	10/27/94					83.12 *
	6/30/95					84.03 **
	9/21/95					82.24
	7/11/96					83.74 ***
	9/11/96					83.74
	11/5/96					83.16
	7/17/97					82.39
	10/9/97					83.00
River EW-2	10/27/94					84.41
	6/30/95					85.32
	9/21/95					83.53
	7/11/96					85.03
	9/11/96					83.85
	11/5/96					83.59
	7/17/97					85.35
	10/9/97					84.20
River EW-3	10/27/94					85.16 *
	6/30/95					86.07
	9/21/95					84.28
	7/11/96					85.78 ***
	9/11/96					84.60
	11/5/96					84.10
	7/17/97					86.31
	10/9/97					85.16

Table 1 - Avery Landing Groundwater Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation
River EW-4	10/27/94					86.49 *
	6/30/95					87.40
	9/21/95					85.61
	7/11/96					87.11 ***
	9/11/96					85.93
	11/5/96					86.44
	7/17/97					87.27
	10/9/97					86.12

Notes:

All measurements in feet.

* River elevation was extrapolated from the river surface slope measured in 1995 and the river elevation measured south of EW-2 in 1994.

** River elevation was extrapolated from river surface slope, based on river elevations measured south of EW-2, EW-3, and EW-4 in 1995.

*** River elevation was extrapolated from river surface slope, and the wood dock benchmark.

T.O.C. - Top of Casing

ND - Not Detected

NA - Not Available

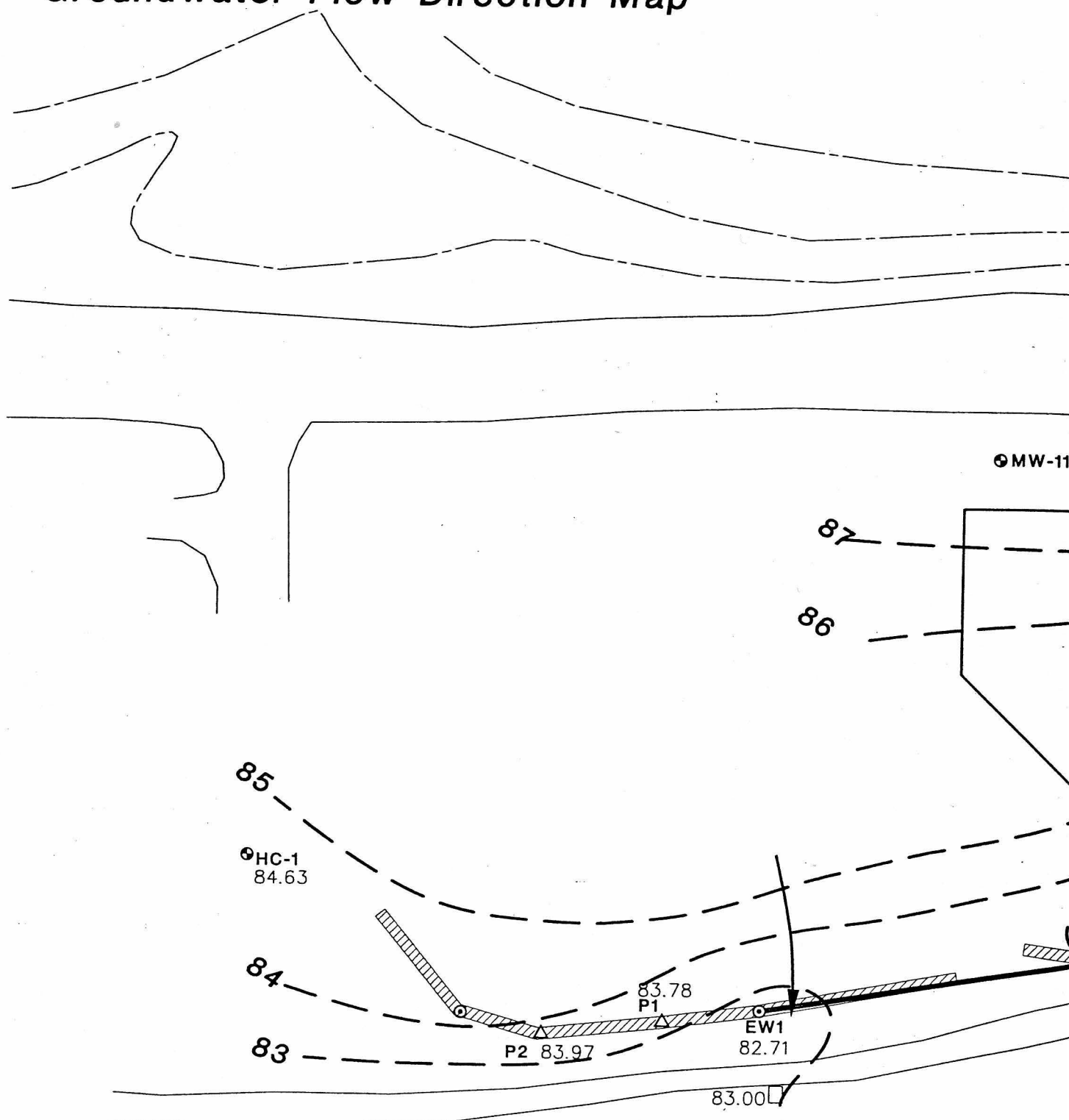
NM - Not Measured

229607/2ndQuarter97.XLS

**Table 2 - Avery Landing Recovery System
Remaining Project Schedule for 1997**

Remaining Schedule	Date
Submit Annual Report	December 27, 1997

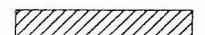
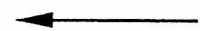
Avery Landing Second Quarter Groundwater Flow Direction Map



- MW-5 Monitoring Well Location and Number
- 83.79 Groundwater Elevation in Feet (10/09/97)
- (86.69) Corrected Groundwater Elevation due to Free Product in Feet (10/09/97)
- EW1 Extraction Well Location and Number
- △ P1 Piezometer Location and Number

□ 87.40

— 87 —

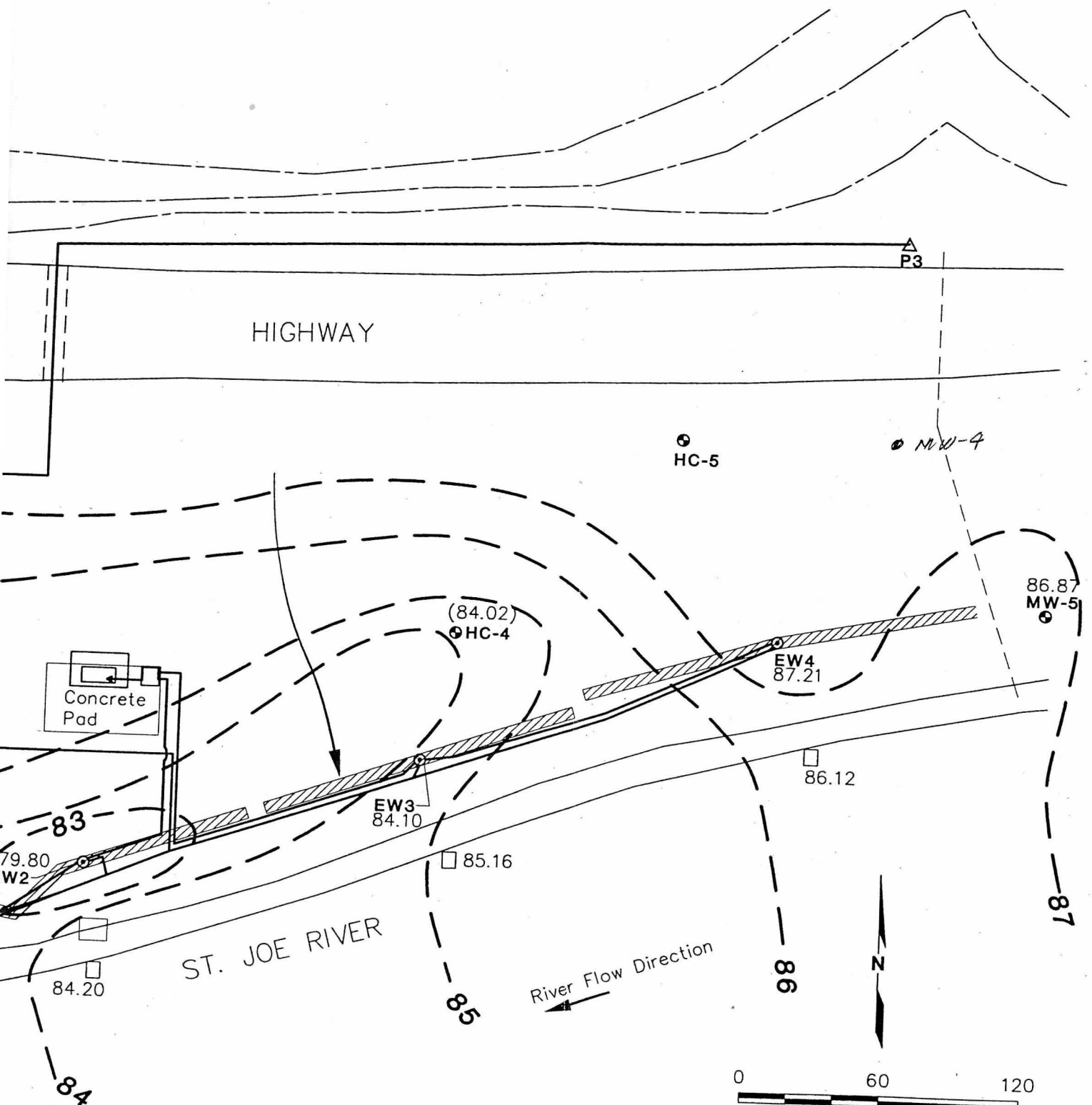


Est

Gr

App

Ext



ated River Elevation in Feet (10/09/97)

dwater Elevation Contour in Feet

ximate Groundwater Flow Direction

tion Trench

Note: Elevation datum is
southwest corner of
Concrete Pad
(100.00 feet)



HARTCROWSER

J-2296-07 10/97

Figure 1